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H.L.

Olin CHEMICALS

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October 18, 1991

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CERTIFIED MAIL

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Kenneth A. Lucas
Senior Remedial Project Manager
United States Environmental Protection Agency
345 Courtland Street Northeast
Atlanta, Georgia 30365

Re: Response to Your Letter of October 15, 1991
Olin Chemicals/McIntosh Plant Site
McIntosh, Alabama

Dear Mr. Lucas:

This is in response to your letter of October 15, 1991, regarding the revised Sampling and Analytical Plan and its supplement, Fish Sampling and Analytical Techniques, submitted September 5, 1991, and September 26, 1991, respectively, and the meeting of October 7, 1991, to discuss these Plans. We appreciate EPA separating the sampling plan issues from some of the other issues raised in our meeting. We believe the sampling plan issues can be resolved to allow us to start sampling in the Basin on November 4, 1991 and finish on November 8. Fish will be collected each day; macroinvertebrate sampling will be worked in as fish collection allows. Samples will be shipped to the laboratory each day starting on November 5. The laboratory will complete the processing and ship the splits approximately November 18, 1991.

We are addressing the comments in your Attachment 1, those comments that relate to the sampling plans, in this response. The comments in your Attachment 2 will be addressed in a separate submission. (There is one area of overlap: Item # 5 in Attachment 2 appears to relate more to the sampling plan and will be addressed in this submission.)

Please let me know if you have any questions regarding the contents of this response or any of the work in progress at McIntosh, Alabama.

Sincerely,



J. C. Brown
Manager, Environmental Technology

jmm

Attachment

cc: W. A. Beal
D. E. Cooper (2)
W. J. Derocher
M. L. Fries

W. G. McGlasson
J. L. McIntosh
T. B. Odom
R. A. Pettigrew

Response to EPA Comments
on
Sampling and Analytical Plans
Dated September 5 and September 26, 1991
EPA Letter of October 15, 1991

Response to Attachment 1 of EPA Letter

EPA Comment:

1. The significance of the inorganics data collected during the Phase I investigation has not been evaluated. Additionally, the source of the elevated level of the Bis(2-Ethylhexyl)phthalate may be related to sources at the Olin Site. Olin shall review the preliminary inorganic laboratory data and report those findings to EPA within three working days prior to initiating mobilization for the Basin Sampling.

Response:

Olin will review the sediment inorganic data collected during the Phase I investigation and provide summary tables, similar to the ones presented at the October 7 meeting for organics and pesticides, as soon as possible, but no later than three working days before mobilizing to conduct the sampling.

EPA Comment:

2. Analysis of fish fillets is important with respect to human health concerns. For ecological concerns, however, whole-body concentrations in fish samples provide more valuable information. Analytical information shall be presented by Olin to support the "fillet plus remains" method as a reasonable estimate of whole-body concentrations. Additionally, the original sample size of five fish per species shall be increased to ten fish.

Response:

The number of fish to be analyzed in a manner to allow the calculation of "whole body" concentrations was the subject of discussion during the Work Plan negotiations. USFWS held the same opinion then as they stated at our October 7 meeting, i.e., that all fish should be analyzed whole body. Olin pointed out during Work Plan negotiations that the objective relative to biota in the Basin was to collect data to allow the ecological assessment to proceed under the guidelines of Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual. This was the basis that EPA used to accept Olin's proposal of 25% of the fish being used to assess the threat to the natural environment by constructing a "whole body" concentration. Olin would like to request an explanation as to why EPA now believes that 50% of the fish will provide a better indicator of the threat to the natural environment than 25%.

In order to proceed with scheduling of the sampling, Olin proposes to analyze five fish as approved in the current Work Plan and SAP and store the remaining fifteen fish carcasses from each species. If there are questions about the results from the five fish or if the five fish results do not provide good indication of the threat to the environment, the option would exist to use the archived fish to supplement the data. The fish would be stored frozen at the McIntosh plant.

Regarding the request to provide analytical data in support of the "filet plus remains" method as a reasonable estimate of whole body concentrations, Olin does not believe that such data can be collected. The only way to collect such data scientifically would be to analyze the same fish using each of the two methods and compare the data. Of course this is impossible since the same fish cannot be both fileted and homogenized whole. If a portion of a filet and a portion of the remains were removed from a single fish, then the remaining whole body homogenized, the representativeness of the portions removed would be questionable. The "filet plus remains" method is approved for use at several Superfund sites where Olin is implementing the RI/FS (Huntsville, AL and Saltville, VA, for example). The approval in these cases is based on the fact that the method is a simple mass balance of the filets' and remains' weights and concentrations, and therefore must be a reasonable estimate. We cannot conceive of factors that could influence the results and cause an unreasonable estimate.

EPA Comment:

3. A smaller mesh size in the macroinvertebrate processing should be used.

Response:

As stated in our letter of October 10, 1991, Olin has reviewed the proper mesh size for the macroinvertebrate processing. Based on this review, we believe the size proposed in the September 5, 1991, plan is appropriate. As recently as 1990, EPA publications continue to list a No. 30 (595 um) sieve as the standard for benthic macroinvertebrate sampling (Klemm *et al*, 1990, Plafkin *et al* 1989). These official guidance documents ignore the fact that it is generally agreed among biologists that "if a more representative sample of the benthos such as chironomids and other small forms (e.g., naidid and tubificid oligochaetes or aquatic worms) is desired" a U. S. Standard No. 60 sieve (250 um) should be used (Klemm *et al*, 1990). Mundie (1971) found that for general benthic surveys mesh sizes of 200-250 um would allow an accurate estimate of the populations. Sieves with mesh sizes smaller than 250 um (down to 62 um) retain very small organisms, generally termed meiofauna. Many of the additional organisms collected are nematodes, which are not identified in most benthic surveys because of the lack of taxonomic manuals. Other specimens encountered using such small mesh include first instar insects, which are not identifiable at this stage of development. Collecting such organisms does not increase data points available and does not help define changes in community structure.

Using a 250-um (No. 60) sieve is widely recognized as an appropriate selection, providing enough usable information on composition, abundance, and distribution to ensure proper decision making, without being excessively time-consuming or too superficial to detect subtle changes.

Specific Comments

EPA Comment:

1. Sec. 3.1, p. 4 - The report states that any impacts will be calculated by comparing relative abundance and indices of community composition along gradients of contaminant concentrations across comparable substrates. The particular "indices of community composition" to be used in the study must be identified and indices for evenness, diversity, and similarity should be proposed. Also "comparable substrates" must be defined.

Response:

The resultant data from the benthic macroinvertebrate identifications will be subjected to several measures to determine if differences exist among sampling sites. In addition to

taxonomic lists of individual taxa and major groupings by replicate and by site, the data will be examined using CLUSTER, SIGTREE, and COMTRE. CLUSTER is a similarity index using the Bray-Curtis coefficient with unweighted average linkage and the distance linkage scale. This program groups the replicates according to both composition and abundance to determine their similarity. The data are then subjected to SIGTREE, which determines the significance within a cluster, indicating that level of branching constitutes a significant grouping. An hypothesis is formulated to test statistically whether two clusters within the overall cluster analysis results are sufficiently alike that they represent the same community. The third method listed is COMTRE, which compares two clusterings (also called dendrograms or trees) to determine if they are related or if the clusterings are random. These clusterings can be the results from the benthic macroinvertebrate data, chemical/physical data, or any other available measurement. For example, this method can test every possible combination of the resultant benthic tree to the resultant sediment chemistry tree to determine if the benthic tree can be related to the sediment chemistry tree.

If sufficient data are available to be compared with established classifications, a biotic index such as the North Carolina Biotic Index or the Hilsenoff Biotic Index will be used to detect differences among sampling stations. The degree of usefulness of such indices will be dependent upon the abundance and diversity of the benthic macroinvertebrates, which are as yet unknown.

Other indices such as the EPT (percent Ephemeroptera, Plecoptera, and Trichoptera [mayflies, stoneflies, caddisflies] to the total); percent dominance, or percent OAC (Oligochaetes, Air-breathers and Chironomidae) could be used if the taxa appearing in samples are appropriate to warrant these types of analyses.

Regarding the issue of "comparable substrates," note that two sediment replicates will be taken along with each set of macroinvertebrate samples (3 separate grabs in a given station) to determine particle sizes, thus helping to define/confirm comparable substrata. Results from the particle size analyses will be subjected to the SIGTREE analysis to determine if sediments from any sites are significantly different. If there is no significant difference between sediments at any site, this parameter can be eliminated as a variable in the benthic composition, abundance, and distribution analysis. If there is a difference, the results will be used to determine if sediment sizes contribute to the benthic community structure.

EPA Comment:

2. Sec. 4.1, p. 6 - Observations made during the Phase I field sampling indicate that emergent herbaceous vegetation was found in only one portion of the lake. This location should be specified. Since a more extensive littoral zone was apparently expected, possible causes of this lack of vegetation (e.g., possible presence of site-related contaminants in nearshore sediments or surface water, or frequent flooding of the area) should be investigated, if not already addressed as part of the vegetative stress survey. Observations should be made in conjunction with the macroinvertebrate survey.

Response:

The SAP will be revised in accordance with this comment.

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EPA Comment:

3. Sec. 5.1.2, p. 9 - After the macroinvertebrates are stained and washed, they should again be stored in a preservative solution (such as isopropyl alcohol) if they are not processed immediately.

Response:

The SAP will be revised in accordance with this comment.

EPA Comment:

4. Sec. 5.1.2, p. 10 - Specify the major taxonomic keys to be used in macroinvertebrate identification. Also, indicate any QA/QC procedures used in conjunction with the macroinvertebrate analysis (e.g., verification of a percentage of the taxonomic identifications by a second taxonomist, maintenance of a specimen voucher collection).

Response:

The SAP will be revised in accordance with this comment.

EPA Comment:

5. Sec. 5.2, p. 10 and Sec. 5.2.6, p. 13 - The additional fish collected but not used for tissue analysis must also be weighed and measured (total length) to give a better picture of fish community structure.

Response:

The SAP will be revised in accordance with this comment. We trust that EPA understands that Olin does not represent that this is a comprehensive study of fish community structure.

EPA Comment:

6. Sec. 5.2.6, p. 13 - The plan must specify whether the fillets will have the skin on or off. Also, indicate the type of surface that the fish will be placed upon during filleting.

Response:

The SAP will be revised in accordance with this comment.

EPA Comment:

7. Sec. 5.5, p. 15 - The plan must specify how the surface used for filleting fish should also be decontaminated between samples.

Response:

The SAP will be revised in accordance with this comment.

EPA Comment:

8. Sec. 5.5, p. 16 - Pesticide-grade isopropanol should be used as the solvent rinse for decontaminating all sampling equipment not made of plastic.

Response:

The SAP will be revised in accordance with this comment.

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Partial Response to Attachment 2 of EPA Letter

EPA Comment:

5. The biological sampling plan should include collecting data on environmental conditions at the time of the study. These data should include:

Water Quality Parameters: Since the presence of aquatic organisms can be affected by physical factors such as dissolved oxygen, the following water quality parameters should be measured during the field sampling: pH, dissolved oxygen, temperature, conductivity, water depth for these measurements (near-surface and near-bottom, at a minimum).

These should be coordinated with sediment parameters which should have already been obtained: grain size distribution, permeability and porosity, bulk density, organic carbon content, pH, color, and benthic oxygen conditions.

Response:

The comment regarding water quality parameters will be incorporated into the SAP. As the comment regarding the sediment parameters correctly surmises, sediment data were collected during the Phase I sampling. These data do not necessarily correspond to the planned locations for macroinvertebrate sampling. Because of this, additional sediment data will be collected at each macroinvertebrate station. This data will consist of grain size distribution, organic carbon content, pH, benthic oxygen conditions, and color. Benthic oxygen conditions and pH will be determined in the water immediately above the sediment. Bulk density, permeability, and porosity cannot be determined accurately in Basin sediments because an undisturbed sample cannot be removed due to the high water content. Such inaccurate data would be of questionable value and are unnecessary for an effective benthic survey.

References

- Klemm, D.J., P.A. Lewis, F. Fulk, and J.M. Lazorchak. 1990. Macroinvertebrate field and laboratory methods for evaluating the biological integrity of surface waters. EPA/600/4-90/030, Cincinnati, Ohio. 256 p.
- Mundie, J.H. 1971. Sampling benthos and substrate materials down to 50 microns in size, in shallow streams. *Journal of the Fisheries Research Board of Canada* 28:849-860
- Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: benthic macroinvertebrates and fish. EPA/444/4-89/001. Washington, D.C.

October 17, 1991
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